

REMARKS

This amendment is responsive to the Office Action of March 4, 2009. Reconsideration and allowance of claims 1, 3-7, and 11-13 are requested.

The Office Action

Claims 1, 3-7 and 11-13 stand rejected under 35 U.S.C. § 103 over Seiko (EP0947953) in view of Cox (Secure Spread Spectrum Watermarking for Multimedia).

The Claims Distinguish Patentably Over the References of Record

Claim 1 calls for generating a signature including signature bits from each of the plurality of regions. In Seiko, every block does not contribute to the watermark. In an initial scan through the image, Seiko computes a hash function H [0031]. The watermark W is computed from the hash function and a secret key K_S . In a second pass through the image, the watermark is embedded.

[0032] Seiko describes looking at the quantizer q for the 63^{rd} coefficient. A watermark bit is embedded in a coefficient value by changing the least significant bit of the value to be equal to the watermark bit. Specifically, changing the value of the 63^{rd} coefficient changes the least significant bit by plus or minus q . As pointed out in [0033], the watermark is not embedded as described above in every block. Rather, in step 106 a decision procedure decides whether to embed a watermark bit. More specifically, in order to minimize the compression size, watermark bits are embedded in the 63^{rd} coefficient of only those blocks where the 63^{rd} coefficient is already non-zero [0034], until the number of watermark bits remaining to be embedded is equal to the blocks remaining. In this manner, if the decision step 106 decides to embed a bit in a given block, then the least significant bit of the 63^{rd} coefficient is set to zero in step 107 and the hash value H is updated [0035].

When all of the blocks have been processed, the digital signature algorithm S is applied to the computed hash value H and the secret K_S to compute the watermark W [0036].

Thus, Seiko does not generate at least one bit of the signature from each of the blocks.

Claim 1 further calls for embedding the signature, without subdividing the signature, by spreading the signature bits of the signal across at least a portion of the image which is larger than one of the regions. The embedding process of Seiko is described starting at [0037] and Figure 3. It will be seen that the embedding process and the second pass of Seiko mirrors and goes hand-in-hand with the first pass discussed above. It is submitted that these two parallel processes are so interrelated that one of ordinary skill in the art reading Seiko would be taught that both procedures should be used together and that one should not look for other embedding procedures. Accordingly, it is submitted that Seiko teaches against substituting different types of known embedding techniques, such as the spread spectrum technique of Cox. Conversely, Cox at page 1675, col. 2, lines 8-35 teaches against using the Cox spread spectrum technique in conjunction with techniques that break the image into blocks.

Accordingly, it is submitted that claim 1 and claims 3-7 dependent therefrom distinguish patentably and unobviously over Seiko and Cox.

Claim 11 calls for means for generating a signature in which each of the blocks contributes at least one bit to the signature. As discussed above, Seiko decides which blocks will or will not contribute to a signature, i.e., all blocks do not contribute at least one bit to the signature of Seiko.

Claim 11 further calls for embedding the signature across the image as a whole without subdividing the signature. By contrast, Seiko uses complimentary block by block processes at each pass through the image to generate and embed the signature. The bits of the signature are subdivided and applied bit by bit to some of the blocks.

It is first submitted that Seiko due to the parallel operations in the first and second passes teaches against embedding the signature across the image as a whole. It is further submitted that Cox who teaches against using the described spread spectrum technique in conjunction with a technique which divides an image into blocks also teaches against being combined with Seiko.

Accordingly, it is submitted that claim 11 and claim 13 dependent therefrom distinguish patentably and unobviously over the references of record.

Claim 12 calls for a computer readable medium including a program module which generates a signature by generating at least one signature bit from each of a plurality of regions. Another program module which generates instructions for embedding the signature without subdividing the signature such that the signature is

spread across the image. In Seiko, every block does not contribute at least one bit to the signature. Moreover, Seiko teaches that embedding should be done in some blocks on a block by block basis using the complimentary first and second passes through the image described by Seiko. Cox teaches against using its spread spectrum technique in conjunction with a technique that divides an image into blocks.

It should be noted that Seiko does not address watermarking flat regions. It is submitted that flat regions, in which there is little variation, are most apt not to contribute to the hash function or the watermark of Seiko, leaving them susceptible to alteration.

Accordingly, it is submitted that claim 12 distinguishes patentably and unobviously over the references of record.

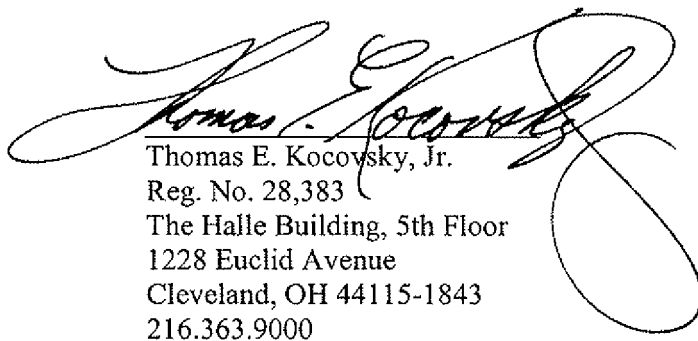
CONCLUSION

For the reasons set forth above, it is submitted that claims 1, 3-7 and 11-13 distinguish patentably over the references of record. An early allowance of all claims is requested.

In the event the Examiner considers personal contact advantageous to the disposition of this case(s), he is requested to telephone the undersigned at 216.363.9000.

Respectfully submitted,

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